CAPITAL REGION WATER

February 10, 2016

Chief, Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
601 D Street NW
Washington, D.C. 20004
Re: DOJ No. 90-5-1-1-10157

Deane H. Bartlett
Senior Assistant Regional Counsel
Office of Regional Counsel (3RC20)
U.S. Environmental Protection Agency, Region 3
1650 Arch St.
Philadelphia, PA 19103-2029

Chief
NPDES Enforcement Branch (3WP42)
Water Protection Division
U.S. Environmental Protection Agency, Region 3
1650 Arch St.
Philadelphia, PA 19103-2029

Program Manager – Clean Water Program
Department of Environmental Protection
South Central Regional Office
909 Elmerton Avenue
Harrisburg, PA 17110-8200

RE: Civil Action No. 1:15-cv-00291-WWC: Separate Sanitary Sewer Capacity Assessment Plan

To Plaintiffs, Civil Action No. 1:15-cv-00291-WWC:

Capital Region Water (CRW) is required to perform a Separate Sanitary Sewer System Capacity Assessment under Paragraph V(F)(30)(a) of the partial Consent Decree lodged February 10, 2015:

a. *CRW shall submit a Capacity Assessment Plan to Plaintiffs for review and comment pursuant to Section VI (Review and Approval of Deliverables) within 12 months of the Date of Lodging. The Capacity Assessment Plan shall describe how CRW will carry out an engineering assessment that satisfies the requirements described below in Paragraph 30(b), and shall include a schedule for the completion of that assessment, and the development of a report that summarized the result of that assessment, by April 1, 2017.*

Paragraph V(F)(30(b) requires CRW to address the following assessment activities in the Plan:

i. CRW shall carry out an assessment of the capacity of the Separate Sanitary Sewer System according to the Capacity Assessment Plan prepared under Paragraph 30(a). The assessment will identify locations within the Separate Sanitary Sewer System that have experienced SSOs and are forecast through hydraulic modeling to experience SSOs during the specific storm events listed below. CRW's assessment shall include:

1. The Spring Creek and Asylum Run Interceptors;

2. All pump stations and force mains;

3. *All sanitary gravity sewers upstream of the interceptors eighteen (18) inches in diameter or greater; and*

4. *An additional ten (10) percent of the sanitary gravity sewers for model continuity and/or that hydraulically impact known chronic SSOs;*

ii. *This assessment shall consider the capacity of the Separate Sanitary Sewer System under current conditions, during the following events:*

1. *Typical peak dry weather conditions;*

2. *2 Year, 24-Hour Storm event;*

3. *5-Year, 24-Hour Storm event;*

4. *10-Year, 24-Hour Storm event.*

iii. *The assessment shall identify locations expected to experience SSOs, during the conditions specified in Paragraph 30(b)(ii), above.*

iv. *The assessment shall consider the current actual firm capacity of CRW's pump stations, and the ability of those pump stations to pump the flows forecast for typical peak dry weather flow rates and the peak flow rates associated with the rainfall events specified in Paragraph 30(b)(ii), above.*

v. *In support of this assessment, CRW shall:*

1. *Complete inspections of the interior of the Spring Creek and Asylum Run Interceptors as required by Paragraph 11(a)(iii);*

2. *Conduct sufficient flow monitoring in addition to the monitoring defined in Section 14, as defined in the Capacity Assessment Plan, to allow adequate development, calibration, and validation of all such portions of the Separate Sanitary Sewer System listed in Paragraph 30(b)(i) included in the H&H Model developed pursuant to the IFMMPP.*

Paragraph V(F)(30)(c) of the partial Consent Decree defines what the Capacity Assessment Report should include:

i. *At the completion of Capacity Assessment, CRW shall submit a Capacity Assessment Report, consistent with the schedule in the approved Capacity Assessment Plan required by Paragraph 30(b), which presents and summarizes the results of the implementation of the Capacity Assessment Plan. The Capacity Assessment Report shall demonstrate that the assessment has been carried out in accordance with the approved Capacity Assessment Plan, shall describe the analyses carried out, and shall identify, using both narrative and appropriate sewer maps, the lengths of sewer and locations within the designated portions of the Separate Sanitary Sewer System that have actually experienced SSOs, and those that through modeling conditions experience Surcharge Conditions or SSOs during each flow condition specified in Paragraph 30(b)(ii).*

ii. By April 1, 2017, CRW shall also submit as part of the Capacity Assessment Report a description of remedial measures necessary to address all of the actual and predicted capacity constraints identified by the Capacity Assessment, estimates of the capital costs of each such remedial measure, and a priority-based schedule for completion of the remedial work necessary to address identified capacity constraints in the Separate Sanitary Sewer System.

This letter report is CRW's Capacity Assessment Plan, in fulfillment of Paragraph V(F)(30)(a).

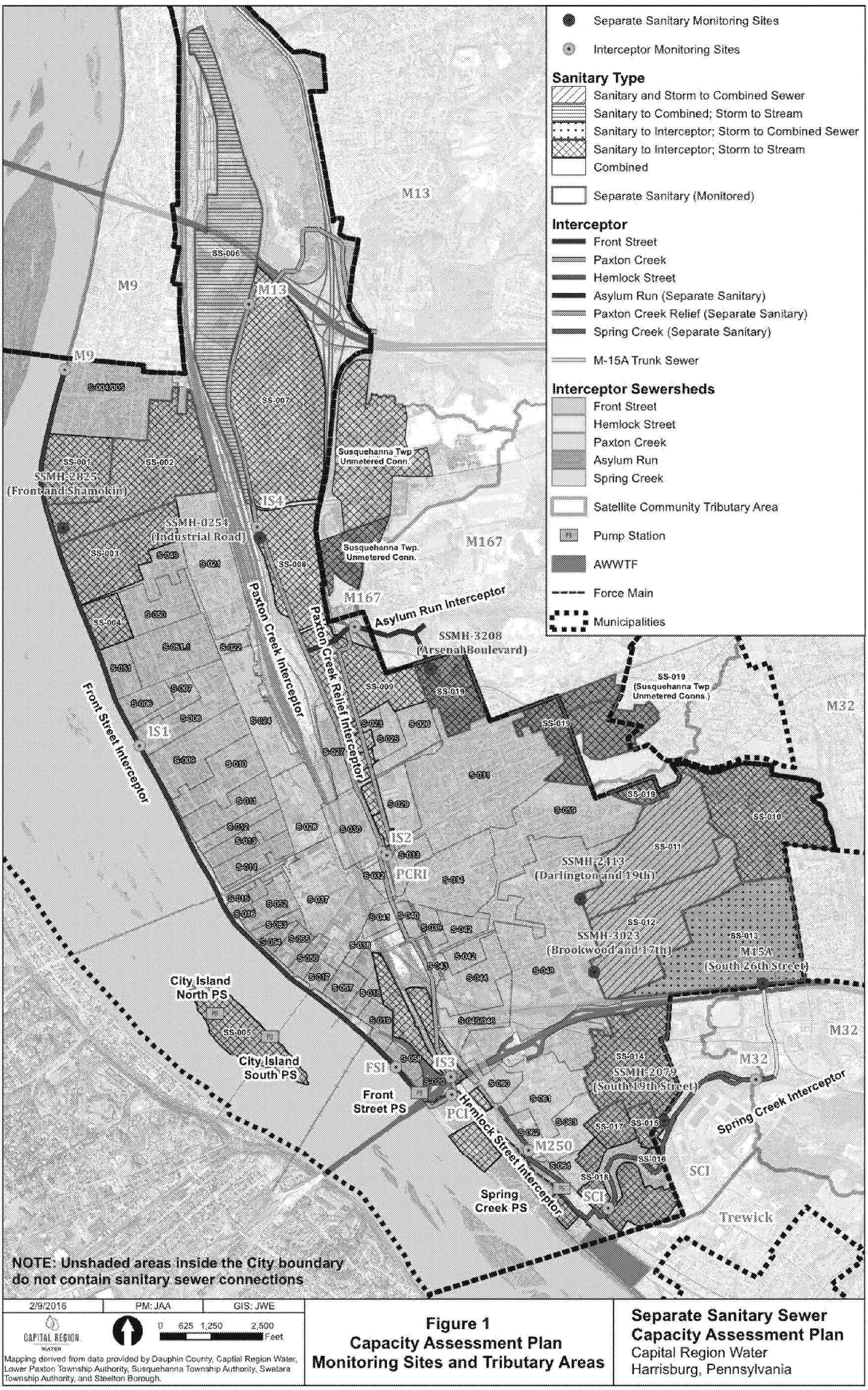
Task 1 Delineate Separate Sanitary Sewers and Sewersheds

CRW, a Pennsylvania municipal authority, owns and operates the municipal sanitary and stormwater conveyance and collection systems within the City of Harrisburg, PA. **Figure 1** shows the location of CRW's conveyance system (i.e., pump stations, interceptor sewers, force mains) and tributary sewersheds and catchments. **Table 1** indicates that approximately 51 percent of CRW's collection system consists of combined sewers that collect both stormwater and wastewater. The remaining 49 percent of CRW's collection system is separate, with 24 percent of these separate sewers discharging into the combined sewer system and the remaining 68 percent discharging directly to the interceptor system. CRW's conveyance system also transports wastewater from approximately 22,128 square miles outside the City of Harrisburg. CRW's separate sanitary sewer system consists of the following components:

- The Spring Creek and Asylum Run Interceptors within the City of Harrisburg.
- The Spring Creek Pump Station / Force Main.
- City Island Pump Stations 1 and 2, and their associated force mains.
- Separate sanitary sewer systems inside the City, which generally collect runoff from the areas marked "separate" on Figure 1.

Table 1. Combined and Separate Catchment Areas Tributary to CRW's Conveyance System

Sewershed Name	Catchment Area (Acres)					
	CRW's Combined Sewers	CRW's Separate Sewers				Separate Sanitary Sewers Outside City
		Sanitary to Combined		Sanitary to Interceptor		
		Storm to Combined	Storm to River	Storm to Combined	Storm to River	
Front Street	683	0	0	0	382	779
Paxton Creek	1,250	267	200	0	658	12,191
Asylum Run	0	0	0	0	99	2,346
Hemlock Street	131	0	0	0	0	0
Spring Creek	0	0	0	170	209	6,812
Total	**2,064**	**267**	**200**	**170**	**1,348**	**22,128**


Separate Sanitary Monitoring Sites
Interceptor Monitoring Sites
Sanitary Type
Sanitary and Storm to Combined Sewer
Sanitary to Combined; Storm to Stream
Sanitary to Interceptor; Storm to Combined Sewer
Sanitary to Interceptor; Storm to Stream
Combined
Separate Sanitary (Monitored)
Interceptor
Front Street
Paxton Creek
Hemlock Street
Asylum Run (Separate Sanitary)
Paxton Creek Relief (Separate Sanitary)
Spring Creek (Separate Sanitary)
M-15A Trunk Sewer
Interceptor Sewersheds
Front Street
Hemlock Street
Paxton Creek
Asylum Run
Spring Creek
Satellite Community Tributary Area
Pump Station
AWWTF
Force Main
Municipalities
M13
M9
M167
M32
M250
SCI
PCI
PSI
IS1
IS2
IS3
IS4
SS-001
SS-002
SS-003
SS-004
SS-005
SS-006
SS-007
SS-008
SS-009
SS-010
SS-011
SS-012
SS-013
SS-014
SS-015
SS-016
SS-017
SS-018
SS-019
SSMH-2825 (Front and Shamokin)
SSMH-0254 (Industrial Road)
SSMH-3208 (Arsenal Boulevard)
SSMH-2113 (Darlington and 19th)
SSMH-3023 (Brookwood and 17th)
SSMH-2079 (South 19th Street)
M15A (South 26th Street)
Susquehanna Twp Unmetered Conn.
Susquehanna Twp. Unmetered Conn.
SS-019 (Susquehanna Twp Unmetered Conns.)
Paxton Creek Interceptor
Paxton Creek Relief Interceptor
Asylum Run Interceptor
Front Street Interceptor
Hemlock Street Interceptor
Spring Creek Interceptor
City Island North PS
City Island South PS
Front Street PS
Spring Creek PS
Trewick
NOTE: Unshaded areas inside the City boundary do not contain sanitary sewer connections
2/9/2016
PM: JAA
GIS: JWE
0 625 1,250 2,500 Feet
Mapping derived from data provided by Dauphin County, Captial Region Water, Lower Paxton Township Authority, Susquehanna Township Authority, Swatara Township Authority, and Steelton Borough.
Figure 1
Capacity Assessment Plan
Monitoring Sites and Tributary Areas
Separate Sanitary Sewer Capacity Assessment Plan
Capital Region Water
Harrisburg, Pennsylvania

According to the partial Consent Decree, CRW is required to use a hydrologic/hydraulic (H&H) model to assess the Spring Creek and Asylum Run Interceptors, the Spring Creek and City Island pump stations/force mains, all separate sanitary gravity sewers 18 inches in diameter or larger, and an additional 10 percent of the separate sanitary gravity sewers to provide model continuity and/or represent hydraulic impacts to known chronic SSOs during typical peak dry weather and wet weather conditions through the 10-year, 24-hour design storm event.

Two of CRW's interceptors – Asylum Run and Spring Creek – only receive flow from separate sanitary sewers, with the majority of this flow contributed by systems operated by other entities outside the City of Harrisburg. Remaining interceptors receive flow from both combined sewers and separate sanitary sewers. CRW completed an inspection of its entire interceptor system in 2015, and has initiated an interceptor cleaning program scheduled to be completed during 2016. In addition, interceptor repairs were identified (including repairs to the Asylum Run interceptor) and have been scheduled under paragraph V(G)(31)(a) of the partial Consent Decree.

CRW is currently calibrating a H&H model of its conveyance system, based on the USEPA SWMM V platform, which represents its entire interceptor system (including the Spring Creek and Asylum Run Interceptors), the Front Street and Spring Creek pumping stations/force mains, combined sewer overflow structures, and regulators. This H&H model is being developed to support combined sewer system characterization and long-term control plan development, as defined by the partial Consent Decree. CRW will submit a Sewer System H&H Model Report by April 1, 2016, as required under Paragraph V(E)(15)(h) of the partial Consent Decree, to document the model development, calibration, and validation. The model report will describe the modeled conveyance system representation, hydrographs representative of flows entering CRW's system from suburban satellite communities, hydrologic parameters for combined sewer catchments, and a demonstration that the model reasonably characterizes hydraulic conditions throughout CRW's conveyance system.

CRW intends to extend the calibrated model of its conveyance system into select portions of the separate sanitary sewer collection system to support the Separate Sanitary Sewer Capacity Assessment. The extended model will allow CRW to understand hydraulic interactions between its combined and separate sanitary systems. Data about the physical configuration, structural condition, and potential obstructions within CRW's separate and combined gravity collection systems is currently being collected through a rapid assessment involving physical measurements, connectivity checks, digital scans, and "pole camera" inspections of connecting sewers at every known collection system manhole. The data necessary to extend the H&H model into the separate sanitary sewer system is expected to be available at about the time the conveyance model is calibrated, and will be added to the model during the 2nd and 3rd quarter of 2016.

Task 2 Identify Historical SSO Locations

CRW is unaware of any chronic SSO locations (including basement backups attributable to CRW system capacity constraints) in the two years since taking ownership of the City of Harrisburg's collection system, nor are we aware of chronic SSOs in the Asylum Run or Spring Creek interceptors within the City that have occurred due to capacity limitations. CRW recently discovered two locations tributary to Asylum Run where debris and grease accumulations created blockages, which coupled with aged pipes and manholes resulted in at least one discharge event per location. These areas will be rehabilitated this year. Under this plan, CRW will collect, review and assess available CRW records and anecdotal information, as well

as monitor system performance and customer complaints that are received during preparation of the Report. Based on this information CRW will identify areas that historically have experienced SSOs, as well as subsequent remedial actions taken and the success of those actions. Locations of historic SSOs will be plotted on a map of the collection system to compare with hydraulic modeling performed under Task 5.

Task 3 Collect / Evaluate Monitoring Data from Separate Sanitary Sewersheds

CRW is collecting rain gauge and gauge-adjusted radar rainfall data, Phase 1 flow monitoring data from CRW's 13 interceptor flow monitoring stations (installed in 2014), and Phase 2 flow monitoring data from CRW's separate sanitary sewer collection system monitors (installed in late 2015). Monitoring data will be used to quantify and characterize base waste water flow (BWF), ground water infiltration (GWI) and rainfall dependent infiltration and inflow (RDII) generated within the separate sanitary sewershed areas of the City of Harrisburg and entering CRW's conveyance system from satellite communities. The GWI and RDII characteristics, in turn, will be used with design rainfall data to develop design hydrographs that can be routed through the H&H model of the existing collection and conveyance systems to evaluate their hydraulic capacity during peak dry and wet weather conditions. The results from these analyses will allow CRW to assess the potential for excessive hydraulic surcharge conditions or SSO discharges to occur. Task 3 of the Capacity Assessment Plan (CAP) describes the process by which the collected flow and precipitation data will be used to achieve these goals.

Subtask 3.1 Collect and Evaluate Available Monitoring Data

Flow monitoring data will be collected from selected City sewershed areas at the monitoring locations shown on Figure 1 and listed on **Table 2**. These sites have been field verified as being acceptable for successful monitoring. There are 12 consecutive months of monitoring data that have already been collected at two City sewershed areas during Phase 1 of the monitoring program. Site M-15A was a CRW legacy monitoring site where monitoring was continued. Site CSO-021-15 was a 15 inch separate sanitary

Table 2. Separate Sanitary Sewer Monitoring Sites

Monitoring Site Name	Site Location	Pipe Size (inches)	Tributary Sewershed Area (acres)	Installation Date
Phase 1 Sites				
M-15A	South 26th Street	18	170.0	11/1/2014
SSMH-0254	Industrial Road	15	199.7	7/31/2014
Phase 2 Sites				
SSMH-3023	Brookwood and 17th	18	133.2	11/17/2015
SSMH-2825	Front and Shamokin	18	146.1	11/18/2015
SSMH-2413	Darlington and 19th	20	133.3	11/17/2015
SSMH-2079	South 19th Street	14	104.1	11/16/2015
SSMH-3208	Arsenal Boulevard	24	164.4	12/9/2015

trunk sewer tributary to a monitored CSO regulator structure. Five additional sewershed areas have been identified for the Phase 2 monitoring program. Data will be collected from the Phase 2 sites over a period

of 12 consecutive months to quantify and characterize the seasonal variability of flows in the separate sanitary sewer system. The total sewershed area tributary to these seven monitoring sites is 1,051 acres, and excluding 65.3 acres outside the City monitored by SSMH-3208, the total City sewershed area monitored is 986 acres. This represents 50% of the total separate sanitary sewershed area within the City limits. Other separate sanitary sewershed areas within the City were found to be infeasible for successful monitoring, either because the tributary sewershed areas were too small, or because hydraulic conditions were unsatisfactory.

Precipitation data will continue to be collected from the network of eight CRW gauging stations, the Harrisburg International Airport gauge, and the Capital City Airport gauge. Data are continuously collected in 5-minute intervals throughout the year. The collection funnels and tipping buckets are heated to facilitate winter monitoring. The gauge data are utilized by a gauge adjusted radar rainfall (GARR) system to quantify and characterize the spatial variability of the precipitation volumes and patterns that occur between the gauge sites. The GARR system combined the gauge data with Next Generation Weather Radar (NEXRAD) reflectivity data to create a detailed and accurate rainfall record that preserved the total rainfall volume reported at the gauges while incorporating the spatial variability provided by the NEXRAD data. The GARR data will continue to be provided with a 1-km by 1-km pixel resolution as times series files with 5 minute reporting increments.

Subtask 3.2 Quality Assurance Measures

CRW will provide the quality assurance and quality control (QA/QC) measures necessary to confirm that the network of flow monitoring equipment provides representative, accurate and reliable data, and that data quality is sufficient for use in the CAP and the development and validation of the H&H models of the CRW service area. QA refers to programmatic efforts to ensure the validity of the reported analytical data. QA programs increase the confidence in the validity of the monitoring data. QC, a subset of quality assurance, refers to the application of procedures designed to obtain prescribed standards of performance in monitoring. The QA/QC Plan that CRW has implemented for the Phase 1 monitoring program will be continued for Phase 2 monitoring. The QA/QC Plan is organized into two main categories: protocols directing activities and procedures in the field, and protocols directing data verification in the office.

Subtask 3.3 Data Analysis

The 12 months of Phase 1 and Phase 2 separate sanitary monitoring data that is collected will be analyzed to quantify and characterize sanitary flows within the City under dry and wet weather conditions. Peak flow will be quantified during dry weather and for a range of storm volumes, intensities and durations. The monitoring data will allow the assessment of the existing capacity of the CRW collection systems to safely convey these peak flows. The results of the flow monitoring analyses will be applied to and combined with the corresponding results from the H&H model simulations and analyses to assess the potential for surcharge conditions or SSO discharges to occur.

Subtask 3.3.1 Dry Weather Flow Analysis

For each of the monitoring sites and corresponding tributary sewershed areas, dry weather periods will be identified and corresponding monitored flows will be analyzed to characterize dry weather hydrology.

The total base wastewater flow (BWF) and ground water infiltration (GWI) tributary to each of the monitoring sites will be quantified from the monitored dataset, as illustrated in **Figure 2**. The flow quantification analyses will be conducted using the Environmental Protection Agency (EPA) Sanitary Sewer Overflow Analysis Program (SSOAP). Peak dry weather flows will be quantified for each monitoring site, based upon the 12 months of monitoring data. The quantified BWF and GWI together will comprise the dry weather flow that was generated within the monitored sanitary sewer system. The quantified BWF will represent the monitored residential, commercial, institutional and industrial flow that was discharged to the sanitary sewer system for collection and treatment. BWF normally varies with water use patterns throughout a 24 hour period with higher flows occurring during morning hours and lower flows during the night. The quantified GWI will represent the monitored infiltration of ground water that entered the collection system through leaking pipes, pipe joints, and manhole walls. GWI varies throughout the year, often trending higher in winter and spring as groundwater table levels and soil moisture levels rise, and subsiding in summer after an extended dry period.

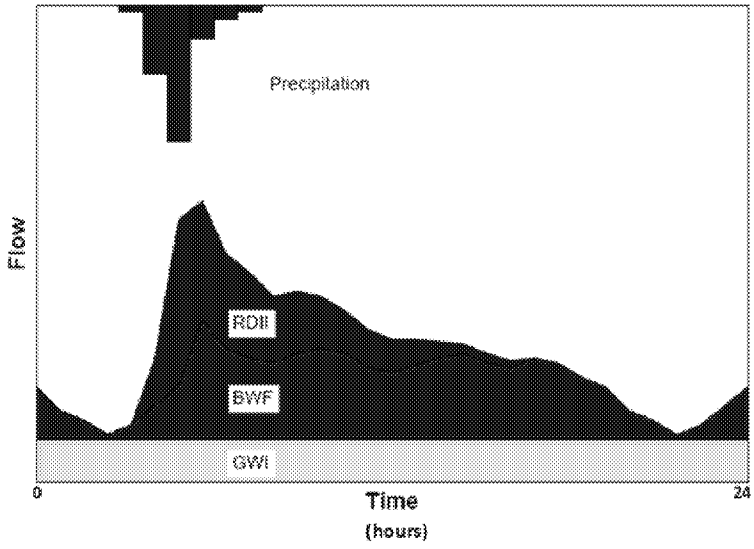


Figure 1. Typical Flow Characterization in a Separate Sanitary Sewer System

For the capacity assessment, the quantified peak dry weather flows and the corresponding monitored wastewater depths within the sewer pipes, based upon the 12 months of monitoring data, will be used to characterize dry weather hydraulics and associated separate sanitary sewer capacities. The portion of the available hydraulic capacity used by the monitored peak dry weather flows will be determined, as well as the remaining reserve capacity available to protect against surcharge conditions and potential basement back-ups and SSO discharges. The analysis results will also be integrated into the H&H model to provide seasonally varied dry weather flow patterns.

Subtask 3.3.2 Wet Weather Flow Analyses

For each monitoring site, monitored storm flows will be analyzed to characterize wet weather hydrology within separate sanitary sewer systems. The total rainfall dependent infiltration and inflow (RDII) generated within each monitored sewershed area will be quantified. The quantified inflow will be the water that entered the sanitary sewer system directly via leaky manhole lids and frames, roof drain connections, sump pumps, foundation drains, and cross connections. Rainfall-dependent infiltration refers to rainfall runoff that filters through the soil before entering a sanitary sewer system through damaged pipe sections, leaky joints, etc. These defects can occur in both the public right-of-way portions of the sewer system or in individual service laterals on private property. Infiltration typically extends beyond the end of rainfall and takes some time to recede to zero after an event.

To support capacity assessment, two categories of wet weather analyses will be conducted on the monitoring data collected at each site. The SSOAP program will be used to quantify the RDII associated with each successfully monitored storm and develop a series of input values for use by the H&H models. Peak depths and flows monitored during significant storm events will be analyzed to characterize wet

weather hydraulics and determine the available level of protection in the CRW collection system against hydraulic surcharge conditions and potential SSO discharges.

The SSOAP toolbox program will be used to analyze the successfully monitored precipitation and flow data, quantify the RDII generated by each of the monitored sewershed areas, and develop an understanding of the RDII hydrological characteristics. The total flow for each monitored storm will be deconstructed into the characteristic components of BWF, GWI and RDII. During the SSOAP analysis, the analyst will implement GWI adjustments to account for seasonal availability, identify the start and end times of the individual RDII events, and produce statistics detailing each event's RDII volume, rainfall volume, and the deconstructed components of the total monitored flow. Scatter plots of the monitored flow and velocity versus the monitored depth will be prepared and used to determine if the trunk sewer was free flowing or under the influence of back water interferences from any downstream hydraulic restrictions. The calculated volume of RDII for each monitored storm will be divided by the corresponding volume of rainfall over the sewershed area and expressed as a percentage or R-value.

This R-value will represent the fraction of monitored rainfall that fell over the tributary sewershed area that entered into the sanitary sewer system. Low values typically indicate a tight sewer system with minimal extraneous flow. On the contrary, high values indicate high quantities of extraneous flow. The analyst will subsequently use the SSOAP program to distribute the calculated RDII volumes and develop a series of three triangular unit hydrographs to represent the fast, medium and slow responses of the sewershed collection systems to each of the monitored storms, as depicted in **Figure 3**. These hydrographs will represent the magnitude and timing of the RDII hydrology of the monitored separate sanitary sewershed areas. Selected individual storm hydrographs will be averaged together on a monthly basis to represent seasonal variability. These monthly unit hydrographs will be used as input into the H&H model for monitored areas, and extrapolated values will be derived for unmonitored areas. The model will apply the unit hydrographs to the monitored rainfall so that the model-simulated sewer system responses should correlate well to the monitored RDII flow.

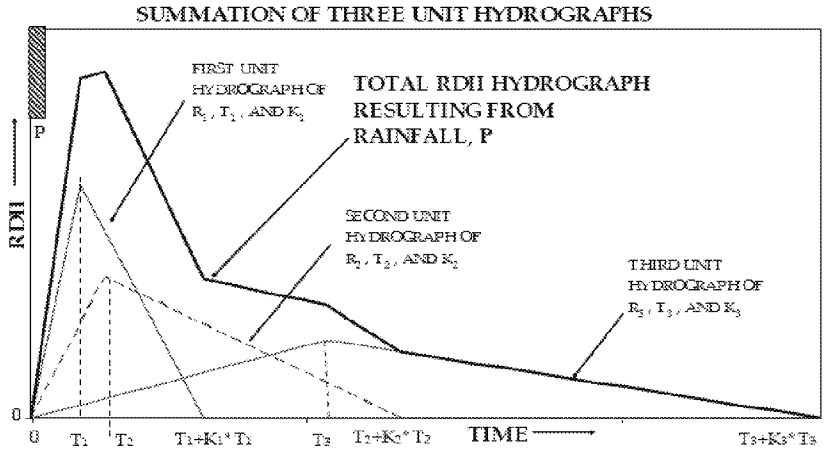


Figure 2. Unit Hydrograph Parameters Derived from SSOAP Toolbox to Build Design RDII Response Hydrographs

Task 4 Develop Synthetic Design Storm Rainfall

CRW will use rainfall intensity-duration-frequency statistics for Harrisburg published in NOAA Atlas 14 to define 24-hour rainfall volumes for the 2-year, 5-year, and 10-year recurrence interval events, as required under the partial Consent Decree. Design rainfall hyetographs will be developed by fitting these volumes to the SCS-Type II distribution, which embeds the intensity of storms with durations less than 24 hours, properly converting precipitation statistics to runoff statistics across drainage areas of varying size,

slope, and storage characteristics. This distribution properly estimates peak flows from drainage catchments over a range of times of concentration shorter than 24-hours (as is typical of the urban drainage system within Harrisburg), as well as properly estimates storage requirements for longer duration events. Monitored summer base flows will be used to develop synthetic design storms for the required 2-year, 5-year, and 10-year recurrence interval events.

Task 5 Perform Hydraulic Capacity Evaluation

CRW will apply the H&H model of its conveyance and collection systems, developed as described under Tasks 1 through 4, to estimate peak flows and water surface elevations within the existing separate sanitary sewer system during the following conditions:

- Typical peak dry weather conditions;
- 2 Year, 24-Hour Storm event;
- 5-Year, 24-Hour Storm event;
- 10-Year, 24-Hour Storm event.

The objective of this evaluation is to define projected frequency of potential SSOs (including water in basement) within CRW's separate sanitary sewer system. Maps and/or hydraulic gradeline plots will be used to depict locations / sewer reaches predicted to experience surcharge conditions that might result in SSOs during each design event. Since Harrisburg is near fully developed, it is expected that existing peak flows will be representative of future flow conditions.

CRW will then use H&H modeling results, in conjunction with observations of structural deterioration and/or sediment/debris buildup from the rapid inspection of CRW's collection system, to evaluate possible remedial measures, including but not limited to the following:

- Sewer cleaning and repair.
- Investigations to identify sources of excessive GWI and RDII and develop control options.
- Backflow prevention for basements subject to frequent surcharging.
- Replacement and/or relief sewers.
- Pumping station enhancements.
- Green infrastructure to control stormwater causing RDII.
- In-system and/or satellite storage within the collection system.

The Capacity Assessment Report is expected to recommend specific remedial cleaning and repair measures, further investigations to identify cost-effective RDII/GWI source controls, and localized capacity enhancements. More wide-spread, system-wide control options, particularly related to capacity concerns in the interceptors and/or attributable to upstream flows from satellite communities, affect

system-wide capacity to control CSOs and thus will be further examined as part of CRW's CSO LTCP (due April 1, 2018).

Separate Sanitary Sewer Capacity Assessment Completion Schedule

Table 3 lists the various milestones in the development of the separate sanitary sewer capacity assessment, along with their anticipated completion date. This schedule shows that some tasks have already begun, while others are being done in conjunction with elements of CRW's long-term CSO control plan. CRW envisions integrating the recommendations of the sanitary sewer capacity assessment into the CSO LTCP schedule in order to properly prioritize and schedule the full range of wet weather control activities. This would include further evaluation and refinement of separate sanitary sewer capacity improvements expected to affect system capacity for CSO control.

Table 3. Separate Sanitary Sewer Capacity Assessment Completion Schedule

Milestone	Complete By
1. Install Flow Monitors in Separate Sanitary Trunk Sewers	December 9, 2015
2. Record Observations / Reports of SSOs within Collection System	Ongoing
3. Submit Capacity Assessment Plan	February 10, 2016
4. Submit Sewer System H&H Model Report	April 1, 2016
5. Complete Rapid Inspection of Collection System	April 1, 2016
6. Complete Extension of H&H Model into Collection System	September 30, 2016
7. Complete SSOAP evaluation of flows in separate sanitary sewers	November 30, 2016
8. Complete Assessment of Hydraulic Conditions in Existing System	December 31, 2016
9. Complete Definition of Remedial Measures	April 1, 2017
10. Submit Separate Sanitary Sewer Capacity Assessment Report	April 1, 2017
11. Submit Existing Combined Sewer System Characterization	April 1, 2017
12. Incorporate Systemwide Control Options into CSO LTCP for Separate Sanitary Sewer Flow Conditions Affecting Long-Term CSO Control.	April 1, 2018

CRW has already begun to implement this Capacity Assessment Plan to support its timely completion in tandem with other partial Consent Decree assignments. We look forward to receiving approval of this Plan and will respond to EPA/DEP comments or concerns as soon as possible. We are also prepared to brief EPA/DEP on our progress and preliminary findings during periodic review meetings and teleconferences. Please contact me directly to discuss any question or concerns you may have.

Sincerely yours,

David Stewart, P.E., BCEE
Director of Engineering
Capital Region Water

cc: Shannon Williams, P.E., CEO, Capital Region Water
Steven Hann, Esq.

John Aldrich, P.E., D.WRE, CDM Smith